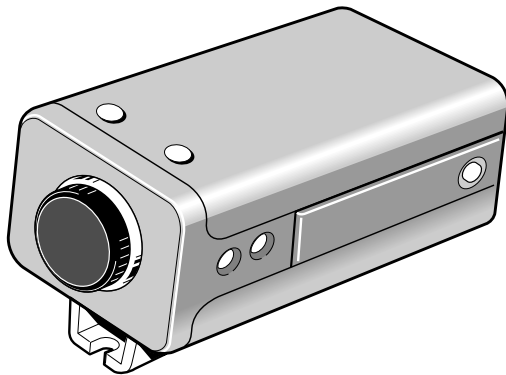


SANYO

VCC-3912

INSTRUCTION MANUAL

COLOR CCD Camera



SANYO INDUSTRIAL VIDEO COLOR VIDEO CAMERA LIMITED WARRANTY

OBLIGATIONS

In order to obtain warranty service, the product must be delivered to and picked up from an Authorized Sanyo Service Center at the user's expense, unless specifically stated otherwise in this warranty. The names and addresses of Authorized Sanyo Service Centers may be obtained by writing to SFS Corporation, SFC's warranty administrator, at any of the addresses listed below, or by calling (toll-free) 1-800-421-5013.

New Jersey Office
210 Riser Road
Little Ferry, NJ 07643
201-641-3000

California Office
1200 W. Artesia Blvd.
Compton, CA 90220
310-537-5830

Illinois Office
900 N. Arlington Heights Rd.
Itasca, IL 60143
708-775-1414

THIS WARRANTY IS VALID ONLY ON SANYO PRODUCTS PURCHASED OR RENTED IN THE UNITED STATES OF AMERICA, EXCLUDING HAWAII AND ALL U.S. TERRITORIES AND PROTECTORATES. THIS WARRANTY APPLIES ONLY TO THE ORIGINAL RETAIL USER. THE ORIGINAL DATED BILL OF SALE, SALES SLIP OR RENTAL AGREEMENT MUST BE SUBMITTED TO THE AUTHORIZED SANYO SERVICE CENTER AT THE TIME WARRANTY SERVICE IS REQUESTED.

Subject to the OBLIGATIONS above and EXCLUSIONS below, SANYO FISHER (USA) CORPORATION warrants this SANYO product against defects in materials and workmanship for the periods specified below. SFC will repair or replace (at its option) the product and any of its parts which fail to conform to this warranty. The warranty period commences on the date the product was first purchased or rented at retail.

LABOR	PARTS	IMAGE DEVICE
2 YEARS	2 YEARS	2 YEARS

EXCLUSIONS

This warranty does not cover (A) the adjustment of customer-operated controls as explained in the appropriate model's instruction manual, or (B) the repair of any product whose serial number has been altered, defaced or removed.

This warranty shall not apply to the cabinet or cosmetic parts, antenna, knobs, batteries or image burns to projection or picture tubes caused by electronic devices or games.

This warranty does not apply to uncrating, setup, installation, removal of the product for repair or reinstallation of the product after repair.

This warranty does not apply to repairs or replacements necessitated by any cause beyond the control of SFC including, but not limited to, any malfunction, defect or failure caused by or resulting from unauthorized service or parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, modification or repair by the user, abuse, misuse, neglect, accident, incorrect power line voltage, fire, flood or other Acts of God, or normal wear and tear.

The foregoing is in lieu of all other expressed warranties and SFC does not assume or authorize any party to assume for it any other obligation or liability.

THE DURATION OF ANY WARRANTIES WHICH MAY BE IMPLIED BY LAW (INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS) IS LIMITED TO THE TERM OF THIS WARRANTY. IN NO EVENT SHALL SFC BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THIS PRODUCT, OR FOR ANY DELAY IN THE PERFORMANCE OF ITS OBLIGATIONS UNDER THIS WARRANTY DUE TO CAUSES BEYOND ITS CONTROL.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS AND/OR DO NOT ALLOW THE EXCLUSION OR LIMITATION OF CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE.

ATTENTION

For your protection in the event of theft or loss of this product, please fill in the information below for your own personal records.

Model No. _____

Serial No. _____

(Located on back or bottom side of unit.)

Date of Purchase _____

Purchase Price _____

Where Purchased _____



21350 Lassen Street,
Chatsworth, CA 91311
Printed in Japan

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Important settings

Depending on the conditions of use, installation and environment, please be sure to make the following settings and adjustments. If you need help with installation and/or settings, please consult your dealer.

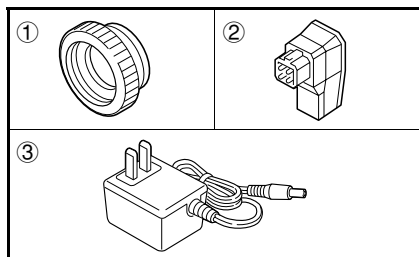
■ Auto-iris lens setting	6 ~ 7
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CAUTION:

Before installing and using the camera, please read this manual carefully. Be sure to keep it handy for later reference.

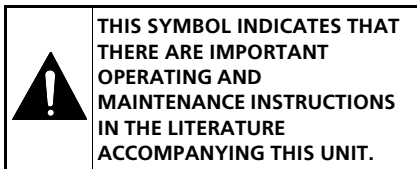
ACCESSORIES

- ① C mount adaptor (5 mm)..... 1 pc.
The C mount adaptor must be used to be able to install a C mount lens on the camera.
- ② Lens iris plug (4-pin)..... 1 pc.
- ③ AC adaptor 1 pc.



INFORMATION TO USER

Safety Guard



WARNING:

TO PREVENT THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

For the customers in Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Pour la clientèle canadienne

Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by **Sanyo** may void the user's authority to operate this camera.

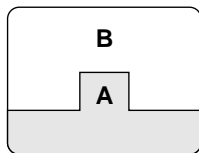
FEATURES

■ Electronic iris function

The electronic iris function regulates the electronic shutter speed. To the contrary of electronic shutters with a fixed speed, the electronic iris modifies the shutter speed according to the CCD input. The electronic iris will automatically control the amount of light entering the camera, so manual iris lenses can be used on the camera.

■ Backlight compensation function

The backlight compensation function will divide the screen in two areas (**A**) and (**B**), as illustrated below. Then, the iris is automatically set so the outside zone (**B**) brightness is given less weight than the brightness from the center zone (**A**), giving the best possible image.



■ 1/3 inch solid state image device CCD

■ CS type lens mount

C mount lenses can also be used with the supplied C mount adaptor.

■ High speed electronic shutter

8 speeds, selectable by switches.

Terminology explanation

■ About the DC type lenses

These lenses use a DC power supply without amplifier circuits. They are also referred to as non internal amplifier type lens or coil type lens.

■ About the VIDEO type lenses

These lenses use both a video signal amplified by internal amplifier circuits and a DC power supply. They are referred to as internal amplifier type lens.

PRECAUTIONS

■ In case of problem

Do not use the camera if smoke or a strange odor comes from the unit, or if it seems not to function correctly. Disconnect the power cord immediately, and consult your dealer (or a Sanyo Authorized Service Center).

■ Do not open or modify

Do not open the cabinet, as it may be dangerous and cause damage to the unit. For internal settings and repairs, consult your dealer (or a Sanyo Authorized Service Center).

■ Do not put objects inside the unit

Make sure that no metal objects or flammable substance get inside the camera. If used with a foreign object inside, it could cause a fire, short-circuits or damages.

If water or a liquid gets inside the camera, disconnect the power cord immediately, and consult your dealer (or a Sanyo Authorized Service Center). Be careful to protect the camera from rain, sea water, etc.

■ Be careful when handling the unit

To prevent damages, do not drop the camera or subject it to strong shock or vibration.

■ Install away from electric or magnetic fields

If installed close to a TV, radio transmitter, magnet, electric motor, transformer, audio speakers the magnetic field they generate will distort the image.

■ Protect from humidity and dust

To prevent damages to the camera, do not install it where there is greasy smoke or steam, where the dampness may get too high, or where there is a lot of dust.

■ Protect from high temperatures

Do not install close to stoves, or other heat generating devices, such as spotlights, etc., or where it could be subject to direct sunlight, as that could cause deformation, discoloration or other damages.

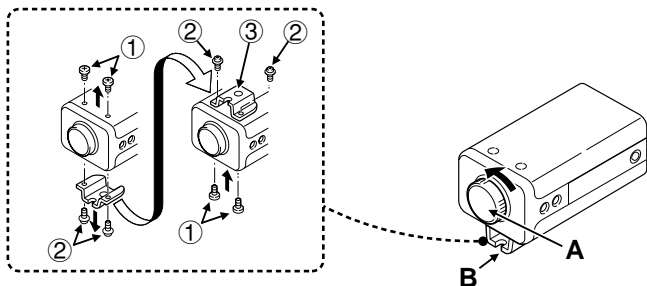
Be careful when installing close to the ceiling, in a kitchen or boiler room, as the temperature may raise to high levels.

Install where the temperature range will stay between -10°C and 50°C . (no condensation)

■ Cleaning

- Dirt can be removed from the cabinet by wiping it with a soft cloth. To remove stains, wipe with a soft cloth moistened with a soft detergent solution and wrung dry, then wipe dry with dry soft cloth.
- Do not use benzine, thinner or other chemical product on the cabinet, as that may cause deformation and paint peeling. Before using a chemical cloth, make sure to read all accompanying instructions. Make sure that no plastic or rubber material comes in contact with the cabinet for a long period of time, as that may cause damage or paint peeling.

PREPARATION



Camera installation

A: Lens mount cap

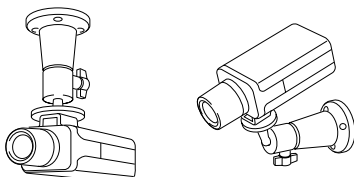
Remove the lens mount cap before installing the lens (sold separately).

- Use with this camera a CS mount type auto-iris lens (for 1/3 inch). Auto-iris lenses regulate the amount of light entering the camera according to the brightness of the subject.
- C mount auto-iris lenses can also be used with the supplied adaptor (see page 7).

B: Installation bracket

The bracket can be fitted at the top or bottom of the camera. To fix the bracket, make sure to use the screws that held the bracket before, and use the other two screws to seal the openings on the opposite side.

- ① Opening sealing screws (**M3x4**) (shorter)
- ② Bracket fixing screws (**M3x6**) (longer)
- ③ Threaded hole for the support (**1/4"-20 UNC**)
 - Mounting at the top (**R1**)
 - Mounting at the bottom (**R2**)

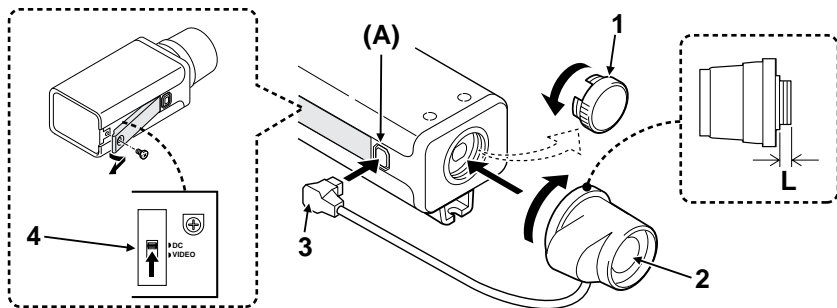


R1

R2

CAUTION:

- When installing the camera support, select a location that can support the total weight of the camera and accessories.
- **This installation should be made by a qualified service person and should conform to all local codes.**



Installation of a DC type lens (sold separately)

1/3 inch CS mount type (Flange-back: 12.5 mm)

- 1 Remove the lens mount cap.
- 2 Install the auto-iris lens onto the camera.

■ Sanyo auto-iris lenses (sold separately)

- VCL-CS8LY: Standard angle, $f = 8$ mm
- VCL-CS4LY: Wide angle, $f = 4$ mm
- VCL-CS2LY: Ultra-wide angle, $f = 2.8$ mm

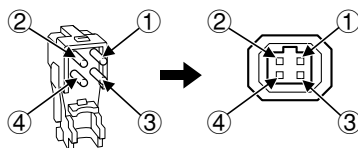
CAUTION:

Do not use a lens if the length "L" is more than **5** mm. That may damage the camera and prevent proper installation.

- 3 Connect the lens plug to the **LENS** connector on the side of the camera.
When using lenses from other makers, make sure that the pins connections in the plug correspond to the ones of the camera. Refer to the lens specifications to check the pins connections in the plug. If they are different from the ones indicated in the diagram, remove the original plug and connect the supplied plug according to the connections indicated by the diagram. (For VIDEO type lenses, please refer to page 7.)

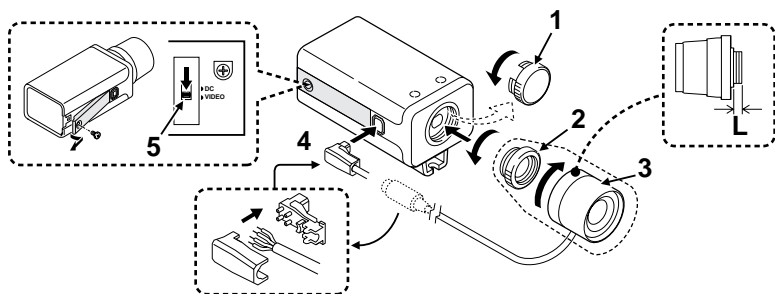
LENS connector layout (A)

- | | |
|-------------------|-------------------|
| ①: Brake coil (-) | ②: Brake coil (+) |
| ③: Drive coil (+) | ④: Drive coil (-) |



- 4 Set the **A.I. LENS** switch to the **DC** position.
The factory default setting is **DC**.

PREPARATION



Installation of a VIDEO type lens (sold separately)

1/2 or 2/3 inch C mount type (Flange-back: 17.526 mm)

- 1 Remove the lens mount cap.
- 2 Attach the supplied C mount adaptor to the auto-iris lens.
- 3 Install the auto-iris lens onto the camera.

CAUTION:

Do not use a lens if the length "L" is more than 5 mm. That may damage the camera and prevent proper installation.

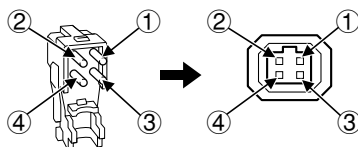
- 4 Check the lens specifications sheet to make sure the lens iris plug layout is compatible with the layout of the **LENS** connector on the side of the camera.

CAUTION:

If the lens iris plug shape and/or the connections layout are different, the supplied lens iris plug will have to be fitted, in order to be able to connect the lens to the **LENS** connector on the side of the camera.

LENS connector layout

- ①: +12 V DC (50 mA max.)
- ②: Not used
- ③: Video output (1.0 Vp-p, high impedance)
- ④: Ground (for video signal and DC power)



- 5 Set the **A.I. LENS** switch to the **VIDEO** position.
Set the **ALC** and **LEVEL** controls on the lens to adjust the iris. Normally the **ALC** volume should be turned all the way to **Av** (Average).

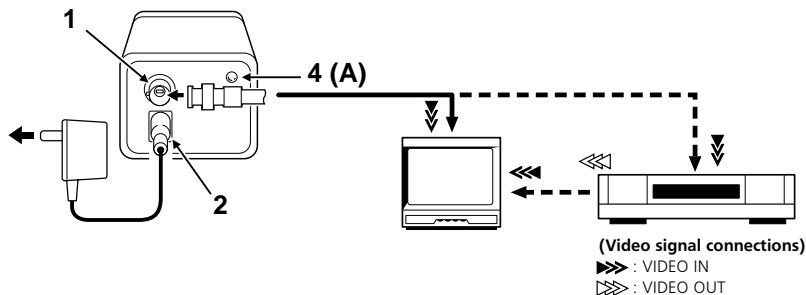
■ If using a VIDEO type auto-iris lens

Depending on the type of lens used, the lens may not perform properly. In such a case, adjust the **LEVEL** volume on the lens casing to correct.

■ Compatible auto-iris lens

- f= 9 mm (Standard angle)
- f= 12 mm (Telephoto)
- f= 16 mm (More telephoto)

CONNECTIONS



Basic connection for monitoring or recording

The peripheral devices (VCR, monitor, etc.) and cables are sold separately.

- 1 Make the video signal connection between the camera and the monitor or time lapse VCR.
- 2 Connect DC connecting cord from the AC adaptor to the **12V DC IN** terminal on the camera.
- 3 Plug the AC adaptor into an AC outlet.
- 4 Turn on the power of all the devices connected to the camera. When the power is connected to the camera, the **POWER** indicator (A) will light. Adjust the picture on the monitor using the Brightness and Contrast controls.

WARNING:

- This AC adaptor is specially conceived for this camera. Never use another type of AC adaptor with this camera, and do not use this AC adaptor to power other types of cameras.
- Not for use with toys.
- Never try to disassemble or modify the AC adaptor.

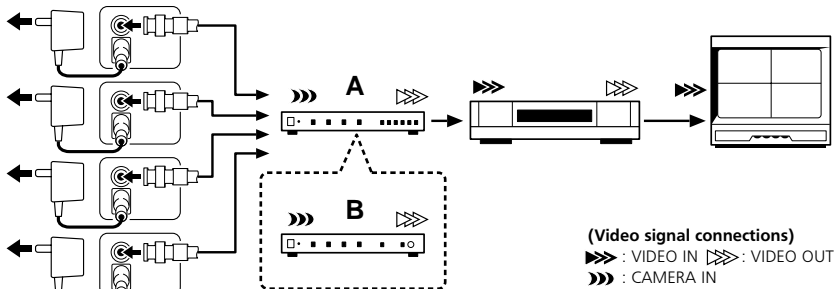
■ Coaxial cable type and maximum length

- Cable type RG-59U, 100 m maximum.
- Cable type RG-39U, 200 m maximum.

CAUTION:

The RG-59U type cable should not be run through electrical conduits or through the air.

CONNECTIONS



Multiple camera connections

The following two connections can be used when using 4 monitoring cameras.

The power connection is as described on page 8, and should be realized for each camera. **The peripheral devices (VCR, monitor, multi-video processor, camera switcher, etc.) and cables are sold separately.**

A) Connection using a multi-video processor.

To use one monitor divided in four areas, to watch over two locations or more.

B) Connection using a camera switcher.

To use one monitor with switching pictures, to watch over two locations or more.

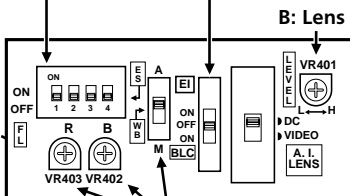
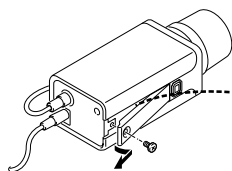
CAUTION:

Before connecting and using the other devices, please read carefully the corresponding instruction manual.

SETTINGS

The switches setting illustrated are the factory default settings.

F: High speed electronic shutter setting (See page 12)
D: Electronic iris (See page 11)
E: Backlight compensation (See page 11)



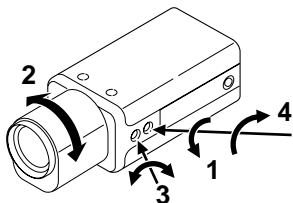
B: Lens Iris

C: White balance (See page 11)

A: Flange-back adjustment

If the pick-up surface is not correctly positioned with relation to the lens focal point, the picture will be out of focus (in particular when using auto-iris power zoom lenses, sold separately). If that is the case, adjust the flange-back position as described below.

- 1 Using a + screwdriver, loosen the **FLANGE BACK LOCK** screw (M2:+).
- 2 Set the zoom lens to the maximum telephoto position, set the focus using the focus ring on the lens.
- 3 Set the zoom lens to the maximum wide angle position, set the focus using the **FLANGE BACK ADJ.** screw.
- 4 Repeat steps 2 and 3, until the image stays in focus when changing from a telephoto shot to a wide angle shot. When the setting is complete, tighten the **FLANGE BACK LOCK** screw.

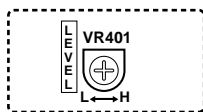


B: Lens iris adjustment

If using a DC type auto-iris lens, you will need to set the **LEVEL** (VR401) volume when shooting in the conditions described below.

L (counterclockwise): To decrease the contrast

H (clockwise): To increase the contrast



- If shooting simultaneously in a dark room and through a bright window.
- If the subject background is extremely bright or dark.
- If the brightness of the picture on the monitor is not correct.

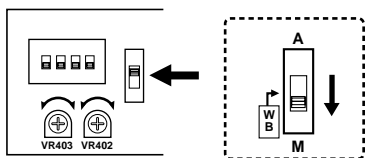
SETTINGS

C: White balance adjustment

Normally the **WB** (white balance) switch is set to the **A** (automatic) position and the white balance is adjusted automatically. If a manual white balance adjustment is necessary, follow the steps below.

Set the **WB** switch to the **M** (manual) position, then adjust the color.

- Turn **R** (VR403) to set the red ratio and/or **B** (VR402) to set the blue ratio.

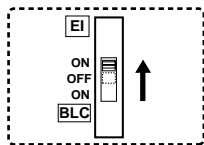


D: Electronic iris function setting

Use a manual iris lens or a fixed iris lens and set the **EI/BLC** switch to the **EI** (electronic iris)-**ON** position, to engage the electronic iris function.

Open the lens iris (shortest F stop setting).

The dynamic range of the electronic iris will be as indicated in table **A**.



CAUTION:

- The electronic iris is suitable for normal indoor use. When the **EI/BLC** switch is set to the **EI-ON** position, do not use an auto-iris lens.

- If used under fluorescent light, the image may flicker. In such a case, change to incandescent lighting or set the **EI/BLC** switch to the **OFF** position and use an auto-iris lens.
- When shooting bright subjects, pay attention to the light angle in order to avoid or minimize the smear phenomenon effect.

■ Table A

F stops	Minimum illumination	Maximum illumination
F 1.2	1.4 lux	70,000 lux
F 1.4	1.9 lux	95,000 lux

■ When using an auto-iris lens (for indoor/outdoor use)

Set the **EI/BLC** switch to the **OFF** position.

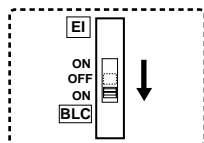
CAUTION:

If conditions are outside the electronic iris operation range or more than the maximum illumination, it will cause saturation of the CCD. In that case, use an auto-iris lens, and set the **EI/BLC** switch to the **OFF** position.

E: Backlight compensation setting

Use an auto-iris lens and set the **EI/BLC** switch to the **BLC** (backlight compensation)-**ON** position, to engage the backlight compensation function.

A clear picture can be obtained, with the multi-zone light measuring system. (See page 3.)



■ If using a VIDEO type auto-iris lens

- The **ALC** volume on the lens should be turned all the way to **Av** (Average).
- If the backlight compensation function does not compensate properly for the conditions, set using the **LEVEL** volume on the lens.

CAUTION:

The electronic iris function and the backlight compensation function cannot operate simultaneously.









F: High speed electronic shutter setting

Normally, the speed setting switches for the high speed **ES** (electronic shutter) are all set to the **OFF** position. This sets the electronic shutter speed to 1/60 sec. The switches can be set as indicated in table **B** to select one of the **8** speeds available.

CAUTION:

- The high speed electronic shutter function cannot be used together with the electronic iris function. When using the high speed electronic shutter, the **EI/BLC** switch must be set to the **OFF** position.
- Using the high speed electronic shutter indoors with low lighting, will give darker pictures. In such a case, add some lights to make sure the lighting is sufficient. If the lighting is very bright, pay attention to the light angle in order to avoid or minimize the smear phenomenon effect.

■ Table B

Electronic Shutter Speed	Switch position
1/60 sec. (OFF/OFF/OFF/OFF)	
1/100 sec. (ON/OFF/OFF/OFF)	
1/250 sec. (OFF/OFF/ON/OFF)	
1/500 sec. (OFF/OFF/ON/ON)	
1/1000 sec. (OFF/ON/OFF/OFF)	
1/2000 sec. (OFF/ON/OFF/ON)	
1/4000 sec. (OFF/ON/ON/OFF)	
1/10000 sec. (OFF/ON/ON/ON)	

TROUBLESHOOTING

Before taking the camera for repairs, please check below to make sure that the camera is used correctly. If it still does not perform correctly, please consult your dealer or a Sanyo Authorized Service Center.

■ No picture on the monitor screen

- Is the power turned on to all connected devices? Is the voltage correct?
- Are all the signal connecting cables correctly connected?
- Is the lighting sufficient?
- Has the lens cap been removed?
- Is the lens type (**DC** or **VIDEO**) correctly selected?

Depending on the type of lens, the **A. I. LENS** switch must be set accordingly.

- Is the iris control correctly set?

A: When using a **DC** type lens, the **LEVEL** volume (inside the camera casing) should be adjusted.

B: When using a **VIDEO** type lens, the **LEVEL** volume (on the lens) should be adjusted.

■ The picture is not clear

- Is the monitor correctly adjusted?
- Is the flange-back position correctly set?
- Is the lens focus correctly adjusted?
- Are the lens surfaces clean?

If there is dust or finger prints on the lens, the image quality will deteriorate. To clean the lens use a soft cloth or a commercially available lens cleaning set.

SERVICE

This camera is a precision instruments and if treated with care, will provide years of satisfactory performance. However, in the event of a problem, the owner is advised not to attempt to make repairs or open the cabinet. Servicing should always be referred to your dealer or Sanyo Authorized Service Center.

SPECIFICATIONS

■ Camera

Color system : NTSC color TV system
(525 TV lines, 60 fields/sec.)

Interlace : PLL 2:1 interlace

Image device : 1/3 inch interline transfer CCD

Picture elements : 537 (H) x 505 (V)

Effective picture elements : 510 (H) x 492 (V)

Synchronizing system : Internal sync

Resolution : 330 TV lines horizontally, 350 TV lines vertically

Video output level : 1.0 Vp-p/75 ohms, composite

Video S/N ratio : More than 46 dB

Minimum required illumination

(incandescent lighting) : Approx. 1.4 lux with a F 1.2 lens,
approx. 1.9 lux with a F 1.4 lens

Backlight compensation : Manual ON/OFF switching, multi-zone light measuring system
(Active when used auto iris lens)

Electronic iris function : Manual ON/OFF switching

Electronic shutter : 8 speeds, selectable by switches
(1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000,
1/10000 sec.)

Flange-back : 12.5 mm \pm 0.5 mm

White balance : Automatic (TTL system)/Manual

Gain control : Automatic

Gamma correction : $\gamma = 0.45$

Lens mount : CS mount (or C mount with the supplied adaptor)

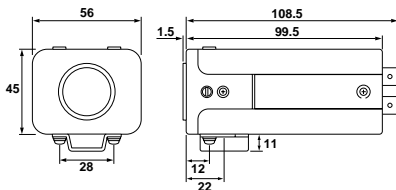
Environmental conditions : Temperature: $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$
Humidity: less than 90% (no condensation)

Power supply : 12 V DC (supplied from AC adaptor)

Power consumption : 12 V DC/150 mA (without auto iris lens)

Weight : Approx. 330 g (without lens)

Dimensions:



■ AC adaptor

Environmental condition : Temperature: $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$ Humidity: within 90 % RH
(no condensation)

Power requirement : 120 V AC ($\pm 10\%$), 60Hz

Power consumption : Approx. 4.3 W (with Camera head, with auto iris lens)

Dimensions : Approx. 55 (W) x 61 (H) x 40 (D) mm

Weight : Approx. 270 g

Features and specifications are subject to change without prior notice or obligations.